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OPHTHALMOSCOPY

L. L. De Mars, Opt.D., F.A.A.O.
Minneapolis, Minnesota

It is with a great degree of hesitation that I take up the task of preparing this paper on so important a subject. It is easy enough to tell the other fellow what to do and how he ought to do it, as well as what is to be seen and how it ought to look when he sees it, but to tell it so that it will become easier for the reader to undertake the necessary training indispensable to intelligent practice with the instrument, that is a different task. However far I may fall short in my allotted task, I hope I will at least have cultivated a deeper regard for ophthalmoscopy in the minds and hearts of a larger group of practitioners.

The ophthalmoscope is the one instrument that properly takes precedence over every other instrument, logically speaking, in ocular examinations and refractions. Can anyone truthfully say that they are in a position to honestly refract or treat an ocular condition unless they have actually observed the interior of those eyes and the retinal surface in its entirety from the center of the disc to the periphery and seen it distinctly?

One of the first cares of the graduate optometrist who aspires to real accuracy in his work, should be to provide himself with the proper instruments by which he may be able to see, easily and clearly, in every eye he examines, all of the details of the fundus leisurely and adequately enough to come to proper and satisfying conclusions as to its normalicity or otherwise. It is not enough to get just a little more than a hasty glimpse of the disc and the surrounding areas and let it go at that. One learns by experience and study and such cursory observations teach nothing except loose methods in practice.

But what is one to do, when, under some circumstances and using the most usual procedure, the pupil is so small as to make a real satisfactory view of the fundus impossible? The tendency is, I know, to take the attitude that since the great majority of cases are normal, you will take it for granted that this one is normal too, and let it go at that. Supposing, however, you are not one of those so prone to take things for granted and that there is an inherent urge to know just how that fundus looks. Granting that mydriatics are out of the question, what are you going to do and how?

Since the use of the direct method is not satisfactory with very small pupils, it naturally follows that the operator must have recourse to other methods if they exist and be trained in them sufficiently to use them in emergencies like this. The only other recourse is the indirect method which gives an enlarged inverted image of the fundus, but how very few practitioners have their eye and hand trained in the use of it? Fortunately the large machine ophthalmoscopes offer a good alternative for the hand method and are a great deal better because both the objective lens and the patient's head are in a fixed position and a longer and steadier view can be obtained for observational purposes.

That is all true, you argue, but the extended use of the necessary comparatively intense illuminant has an irritating effect on the retina and the un-atropinized ciliaries and also this effect, in a measure, neutralizes the relaxation of the accommodation. Even so, is that a good reason why a searching investigation of the fundus should not be made? Supposing it does place the eye at a disadvantage for accurate refracting, do you really have to hurry through with the case? Why not make your entire set of objective examinations at this setting, then make an appointment for another examination at a future date and excuse the patient? In this way you would give the eyes an opportunity to get back

to normal, and you would have a chance to go over any peculiarities of the case and then at the next examination the ophthalmoscope need not be used and you could proceed without exciting the ciliaries unduly.

Refracting a case without using the ophthalmoscope reminds one of the years when it was a common thing to hear fellows say: "Oh well, you just correct the ametropia and let the extrinsic muscles go, they will take care of themselves after you have done that." Nowadays no optometrist, worthy of the name, would think of finishing a case without careful and complete attention to the existing condition of the extrinsic muscles, in fact, he wants to know at the start of a refraction, before he has used a lens before the eyes, what kind of phoria, if any, is manifested. This has come about largely through the invention of instruments of greater ease and precision for this kind of work and the increased educational interest they have engendered. With ophthalmoscopy the same kind of evolution is taking place. In witness of this there is on the market now a large machine ophthalmoscope providing indirect illumination, a real erect image which with certain appliances can be magnified to any degree and which allows the image of being seen stereoscopically by one person or by other appliances to be observed by two persons at the same time. While the price of this instrument is beyond the reach of the average optometrist, neighboring practitioners might buy or rent them with profit.

Using the ophthalmoscope, one first notices the color of the reflex. This may be very red, suggesting an inflammatory condition, or it may be any one of a variety of shades of red, all of which is determined by the amount and differences in the arrangement of the choroidal and retinal pigment. Since the red or reddish hues are caused by reflection of light from the network of blood vessels and the whitish colors are caused by the reflection from the sclera, it is easy to see that the pigmentation of the interior of the eye has much to do with the varieties of color manifested to the observer. All of which leads me to say that little dependence can be placed on the color of the reflex as a diagnostic symptom of a pathological condition.

A systematic examination of the fundus might be made by the following steps:—1. Examine the complete edge of the disc. 2. Notice the appearance of the area of the disc and of the blood vessels from the central canal to beyond the edge. 3. What is the appearance of the area surrounding the macula. 4. Look for irregularities in the peripheral parts. If one is thoroughly familiar with the normal conditions in each of these four items, opthalmoscopy has become a fascinating and a profitable practice in optometric procedure.

The first move in our systematic investigation of the eyeground is to examine the complete edge of the disc. Be sure you actually see and can trace the line of demarkation between the disc and the surrounding area, whether the line is white or black and recalling that the nasal side is often more difficult to see because of the greater abundance of nerve tissue passing over this part than on the temporal side. With the direct method where the pupil is large, it is indeed easy to see this, but where the pupil is not so large, it requires a little more effort and time, especially in those cases where the pigmentation is most abundant. I offer this suggestion as the first step because of the ease in determining a possible diseased condition. If the edge of the disc cannot be seen either in its entirety or at some locations by both the direct and the indirect methods, it should provoke a question in one's mind as to whether a pathological condition does exist and lead one to a closer investigation of the fundus for verification.

In a recent case my attention was at once arrested because, try as I would, I could not determine the slightest line indicating the edge of the disc. The circular appearance was there, but spread over a greater area than usual and also without the definitely marked outline, so with observation of other details my suspicion of a choked disc were verified, indicating non-inflammatory papilitis.

Before much is said about the disc in passing to the second step, a few words regarding its anatomy may lead to a better understanding. The optic nerves enter through the sclera at the back of the eye ball. That part of the

sclera through which they pass is pierced by many tiny openings so that the whole area is called the lamina cribrosa. The central artery which enters the optic nerve from the orbital cavity about a centimeter back of the globe of the eye ball, penetrates to the center of the nerve itself and then turns sharply and runs parallel with them to the interior surface of the eye ball. At this point the optic nerves separate circularly and turn at right angles to radiate in all directions and form the innermost tunic. More of them, however, pass to the nasal than to the temporal side. The exhibit produced by the bundles of nerves in turning is called the optic disc or blind spot. The physiological cup is the head of the cylindrical canal formed as the nerves separate. It is along this canal extending from the lamina cribrosa to the physiological cup that the central artery enters and the central vein leaves.

A very important factor which should not be overlooked is the circulatory system of the optic nerve and disc. The central artery of which we have written is an end artery, that is, it does not anastomose or connect up with any other arteries or blood vessels which enter or leave the retina by any other way. In other words it is a system all to itself. But to limit ourselves to the nerve and disc all alone, I am going to quote from Dr. James Thorington's book, **The Ophthalmoscope and How to Use It,** third edition, page 96. He writes: "The posterior ciliary arteries perforate the scleral coat around the entrance of the optic nerve where it enters the sclera, and these vessels send off branches which anastomose and form an arterial circle called the circle of Haller. From this circle fine twigs pass between the transparent nerve fibers which lie anterior to the membranca cribrosa, and they in turn anastomose with branches from the central vessels of the nerve. From this description the reader will understand and appreciate the circulation which takes place in the nerve head and that the vascularity is connected with the choroidal as well as with the retinal system of vessels."

The usual appearance of the disc is circular or a vertical oval of a whitish or pinkish white color. Sometimes there is a slight difference in the shade of the temporal and nasal sides because of the greater abundance of nerve fibers passing toward the nasal side. The whiteness of the disc is because of the transparence of the nerve fibers which permit of the whiteness of the sclera to shine through. The almost imperceptible pink hue is caused by the blood in the tiny vessels among the nerves. These colors are the natural ones but are modified by the color of the light used with the ophthalmoscope. In some instruments it is yellow, in others it is white. Keep this in mind when you are working. Logically, but two things can influence the color of the surface of the disc, inflammation, causing the tiny blood vessels to become highly infiltrated and causing the surface of the disc to assume a red hue, or, atrophy of the nerve fibers causing them to become opaque and a more chalky white than the normal.

Before a hasty diagnosis of pathological conditions on account of color is made, the physiological cup should be thoroughly considered. The physiological cup is located toward the temple side of the center of the disc and is that point to which the larger vessels appear to converge. It is that point which has that glistening white appearance in so many instances. In health it is not always the same size. In some eyes it is so very small that it cannot be seen at all because it is entirely filled with the central artery and vein, in others it may occupy the larger part of it but never all of it. The spotted appearance you sometimes see is caused by the sieve-like character and appearance of the lamina cribrosa. This lamina cribrosa is the weakest spot in the whole eye ball. Being formed of only the innermost layer of the sclera and being punctured by numerous tiny holes for the passage of the optic nerves, any intraocular pressure as arises in glaucomatous eyes, will cause the physiological cup to deepen. On the other hand in cases of choked disc, the optic nerve swells and also deepens the cup. If you would determine unusual depths of the cup, use the direct method. Fix your attention on the blood vessels at the rim of the cup and find the lens with which you can see these clearest and best. Now fix your attention on the bottom of the cup and find the lens with which you also see clearest

and best. Each difference of three diopters in your readings will indicate a depth of one millimeter.

Usually the blood vessels on the disc present a very ordinary picture, although not always an identical picture as to number, direction and ramifications. Cupping of the disc as caused by glaucoma and swelling of the disc as caused in papilitis, present varying aspects. In the one case they dip down abruptly over the edge of the cup and disappear in a part of their course to the bottom of the cup; in the other, the number is somewhat increased and swollen and they radiate out over the obscured disc edge.

Leaving the disc we turn our attention to the region of the macula which we can locate at about twice the distance of the diameter of the disc toward the temporal side of the disc itself. The retina, being almost transparent, cannot be seen easily except, perhaps, as a kind of shimmering reflex. The macula, therefore, is not readily seen nor easily recognized. It cannot be seen in an eye with small pupils because of the consequent contraction of the sphincter muscles caused by the intense light and also to the troublesome corneal reflex getting in the way. There are no visible blood vessels in the retina at the macula, but there is usually a deeper shade of red at the tiny fovea than in the surrounding areas. This is because the fovea is a cone-shaped pit in the macula in which all the layers are thinned down until only the rods and cones are exposed to the light waves, thus allowing the reflected light from the choroidal blood vessels a more ready passage and giving the brighter red appearance. Of course examination of the macula region is usually made in the general examination of parts outside the disc, but no ophthalmoscopic examination should be finished until special effort is made to see the macula or the area in which it lies.

Starting afresh from the disc in the fourth and last phase of our schedule, suppose we take each of the major blood vessels separately and explore them out into the uttermost parts of the periphery. In this way we will be sure to make a thorough examination and, being acquainted with the normal aspect by practice and experience, any irregular or unusual appearance will at once command the attention. The writer will never forget how startled he was when he first chanced upon a case of retinitis pigmentosa with its bespatterings of black over the peripheral parts of the fundus.

In making the explorations of the blood vessels one should always take a little care and note how they cross one another. The crossing should be even and natural. If there are evidences of obstruction or stagnation, it will be caused by a diseased condition such as an expanded artery in high blood pressure bearing down on the vein and impeding the blood flow.

There are hosts of people today who are in apparent good health as far as they know. They wouldn't go to a general practicing physician for an examination, because "what's the use"—they are getting along all right. Suddenly—or gradually, their eyes begin to cause them some concern. They come to us, perhaps, because all they think they need is a pair of glasses. We therefore have the first opportunity to witness any subnormal condition. With our ophthalmoscopes we are privileged to observe the condition of the living blood stream at the only point that it is visible without an operation, and, if we have trained ourselves for it, we are in a position to determine symptoms of certain constitutional diseases.

Thus it becomes the duty of every practicing optometrist to equip himself with a satisfactory ophthalmoscope and become thoroughly familiar with the direct and indirect forms of its use. This, practice alone can do.

NOTES, CASES AND INSTRUMENTS

THE WISEMAN VISUAL ACUITY CHART

Carel C. Koch, Opt. D., F.A.A.O.
Minneapolis, Minn.

Dr. E. G. Wiseman, Optometrist of Buffalo, N. Y., author of several optometric works, has again given the profession something of real value in this new test chart. This chart is the result of several years' intensive study upon the subject and should assist the profession in many ways.

The complete chart is shown in figure 1, reduced from 17x23 inches. In the center at the top of the chart is the astigmatic fan, composed of carefully calculated lines with 10 degree separations. This fan will indicate an astigmatic condition, easily to one-fourth and in many cases to one-eighth of one dioptre. The 10 degree separations are so spaced as to give the refractionist the greatest aid in the accurate determination of the axis of the astigmia. This is a decided improvement over the charts using the 30 degree separation.

At each side of the fan will be found the broken ring design in various sizes to be used for illiterates, children, etc., as well as the usual run of cases. This design is probably the most accurate ever devised for the purpose of measuring visual acuity, inasmuch as the design is symmetrical, and when made in various proper sizes as Wiseman has done, can be used to good advantage in every case. The patient's visual acuity can here, as elsewhere on this chart, be recorded in percentage, the patient merely indicating the position of the opening in the arc or ring.

Below these Dr. Wiseman has placed the test letters, and it is here that the greatest "chart" improvement has been made. The letters are not arranged in horizontal rows, but rather in staggered divisions, thus making it quite impossible for patients to memorize much of the chart. Furthermore, the letters in each division are carefully calculated as to size and as is easily seen, certain letters which are difficult to read have been made larger in size than others which are more legible. For instance, the letters "B" and "O" in the 30 per cent division at the lower portion of the chart to the left. "B" being one of the most difficult letters on the chart to distinguish, is naturally larger than the letter "O," which is comparatively easy to read. Now despite their variance in size these letters are in the same division and a person having but 30 per cent visual acuity will experience little difficulty reading either with this arrangement. The relative size of the letters has been carefully calculated by Dr. Wiseman in a series of check tests made under his direction by the Tri-City Optometric Society.

Another advantage of this chart lies in the fact that each division is separated from the preceding one by but 10 per cent. There are no large jumps in size between the various divisions of letters and the 10 per cent arrangement simplifies the work of recording the acuity of vision.

To quote from a letter by Dr. Wiseman:

"The writer has used this chart as a whole for several months, and the reduced letter idea since Jan. 1, 1924, and, while not wishing to seem eulogistic about something new, he will say that it is beautifully accurate and has revolutionized for the better his recording of acuity of vision. When the eye now registers, say, 90 per cent or 100 per cent vision, it has 90 per cent or 100 per cent vision, and if tomorrow or next week or next year it registers 80 per cent or 125 per cent vision, then it is the visual system which has changed and not the mind of either the examiner or the consultant. It seems that the guesswork of two fallible intelligences has been eliminated as much as it is practically possible, and one obtains a record which is nearest the truth at that particular time; he does not get a record which may be 40 per cent or 50 per cent wrong."

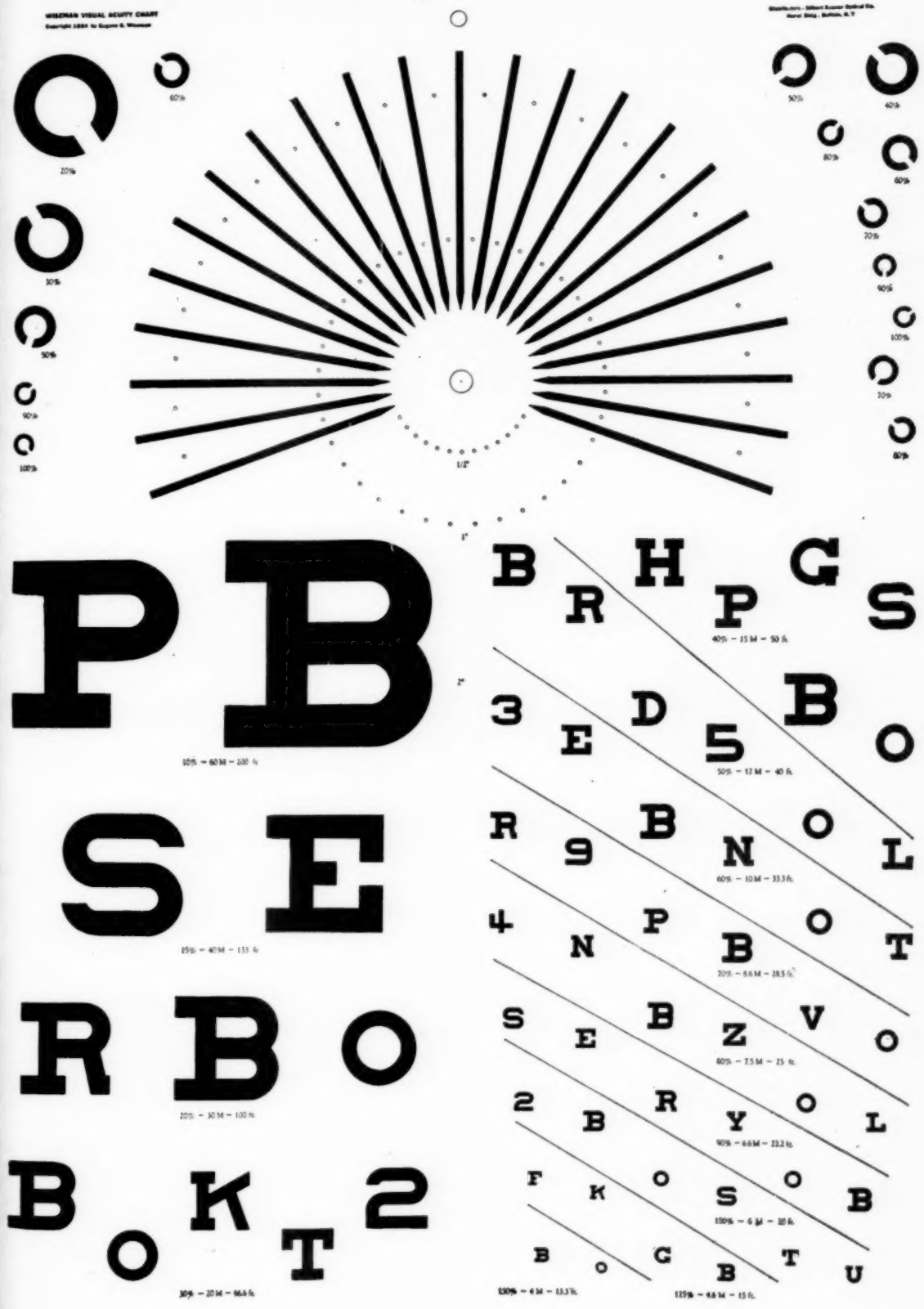
WEBERIAN VISUAL ACUITY CHART
P B
S E
R B O
B K 2
O T
B H G
R P S
3 E D 5 B O
R 9 B N O L
4 N P B O T
S E B Z V O
2 B R Y O L
F K O S O B
B O G B T U

Figure 1

AN INTERESTING MUSCLE CASE

H. M. Block, O.D.

Waxo, Texas

History: Mr. G. T. N., bookkeeper for a large cotton agency, reported September the 2nd for my services. The most disturbing elements were temporal headaches and throbbing in the middle of the head in the brain direct, these beginning shortly upon rising and not abating until after retiring. It seems as though he had never had a pair of glasses that relieved this trouble.

Examination: Old correction, O. U. +.25=+.75 axis 10°. This was prescribed by a prominent oculist. My examination was as follows: Vision, O. D. 60%, O. S. 60%, retinoscope, O. D.+.75=+.75 axis 180°, O. S.+.75 =+.75 axis 160°. Ophthalmometer, O. D. 1.00 dioptre of astigmatism against the rule axis 180°, O. S. 1.00 dioptre of astigmatism against the rule axis 15°. Subjectively I prescribed O. D.+.75=+.75 axis 180°, O. S.+.75 =+.75 axis 15°. Phorometry: there proved to be, by the cover test, 27 P. D. of divergent strabismus of the monolateral, concomitant, alternating, variety. Here was the trouble.

Treatment: The writer questioned his client if he had ever received a severe blow on the head, to which he received a negative answer; the client was then asked how long his eyes had been crossed; the answer was, to the best of his memory, all his life. Mr. N. reported that he had never had anything done for the crossed condition; however, about a year ago, Dr. H. T. A., a local oculist, offered to operate, but as the surgeon would promise very little and was not over anxious to do the work, he refused to submit to the surgical procedure.

The first step toward rectification of the imbalance was to prescribe from the test case 27 dioptres of prism power, bases in. This provided fusion for infinity which was proved by the fact that the finger held 13 inches from the eyes was seen double, whereas the distant object was only seen singley, which showed that there was physiological diplopia. The client was told to sit in the window of his office with the prisms on, and to watch moving objects from the right to the left and then from the left to the right and so on without moving his head. This was done in an effort to reunite the brain centres controlling right and left version. He was also told to dispense with his ametropic correction as long as he could without discomfort, this to stimulate the weakened interni recti.

With this correction there was no fusion at nearpoints, first one eye being used, then the other, whichever one was the most convenient, so if the object were on the right side the right eye would be used, and vice versa.

Two days later, Mr. N., as directed, reported back to me. Fusion was now possible at near points within a field of about 10°, but no more. When the object was more than 5° to the right, the right eye would follow and the left would deviate to its position that was the most restful, and the same is true if the object were more than 5° to the left.

For six days the client wore the 27 P. D. prisms and at the end of this time I was reasonably sure that the fusional sense was strong enough to work through its own ability, so accordingly I reduced the correcting prisms to 22 P. D. and treatment was commenced with a 2 P. D. prism base out. On this same day it was noted that the patient could now fuse momentarily without the correcting prisms. When both the correction for ametropia and the correction for the muscular imbalance was worn there was no discomfort with the slight exception of mild dizzy spells after long concentration on an object not in motion; these, however, were becoming less frequent and less disagreeable.

On the 10th of September the correcting prisms were again reduced, now to 20 P. D., and treatment was with 4 P. D. prisms base out. The next step I took to ascertain my success was to test and see if both eyes were being used in near work. This test was made with the Harman diaphram instrument and revealed that only one eye was used when doing near work, as there was only one object seen.

When Mr. N. reported on the 12th, the correcting prisms were again reduced 2 P. D., making a total now of 18, and exercise was with a 4 P. D. prism base out. Fusion was now so completely built up that it was possible for the client to maintain single binocular vision without the aid of the

prisms. In fact when rest for the interni was desired it was necessary to cover one eye. On the diaphram test both objects could be seen on four or five cards; after this number the eyes would turn out for want of rest.

A gradual reduction of the correcting prisms and treatment with prisms was effected and in this way the fusional sense was built up and the squinting became lessened and lessened.

On October the 2nd, correcting prisms were dispensed with and the ametropic correction substituted in its place. Fusion was now so completely established that at no time did the eyes deviate. There was physiologic diplopia at both near point and at infinity. The two objects were always in evidence on the diaphram test, never one, and there are 15 charts in my set. Perfect comfort was reported from sustained use of the eyes and at no time did they cross.

On the 6th, there proved to be 18 P. D. of adduction. The client was questioned very closely as to relief, comfort and single binocular vision, to which he received very pleasing answers. Accordingly I decided to dismiss my patient with specific instructions to report back if at any time the eyes deviated or gave any disagreeable symptoms of defects.

As to the exact etiology of the case the writer is still undecided. The muscle trouble could not be physiologic as the refraction is compound hyperopic astigmatism, there had been no severe, or otherwise, disorder of the nervous system, and no traumatic cause. I have about concluded that his squinting condition was brought about due to a lack of co-ordination of the brain cells controlling the fusional sense. If you have any ideas about this, the writer would welcome them. Now then, what have I accomplished? I have scored another victory for optometry. In view of the fact that Mr. N. had consulted no less than six oculists, and none had made an attempt to rectify the muscular trouble, he has branded them inferior to ourselves as far as mental equipment is concerned. There is no doubt that we have another booster for our profession now that a mere optometrist had apprehended his desires. Truly it was a warm and grateful handclasp that he gave me when told that he was in condition to proceed with his work a normal man.

I have only seen Mr. N. once since dismissal and then he was full of praise and reported perfect comfort and satisfaction. He has paid his bill in full, so I conclude from this that he is satisfied and doing good.

BOOK NOTICES

Oculo-Prism Treatment. By Samuel H. Robinson, O.D., F.O.S., F.A.A.O. Cloth. Pp. 188 with 69 illus. by author. Chicago: Professional Press, Inc. 1924.

Robinson ably chose his subject, that of oculo-prism treatment. There are few refractionists that have not experienced a desire for a well rounded treatise on ocular muscle exercises as we well know the inadequacy of refractive correction. Robinson claims no originality for this work, as many earlier workers such as Worth, Priestly-Smith, Stevens, Maddox, Sheard, Howe, Savage and others have worked out the problems of innervational control of the extrinsic ocular muscles and demonstrated that a certain degree of co-ordination between the various ocular muscles was necessary for comfortable vision. Certain courses of procedure have been suggested by these same workers for the alleviation of any imbalances. Robinson, through his own practice, has demonstrated that purely optometric treatment is adaptable to the strengthening of weak extrinsic ocular muscles and has placed the facts before us in a compact little volume. There is no lengthy digression into the study of the anatomy of the muscles as the assumption is made that the reader is familiar with the subject. The chapters are well arranged and subtitled and to make the matter of easy reference adaptable for the busy refractionist there is a summary of the subject permitting the finding of a topic readily without the inconvenience of thumbing the entire volume.

E. O. F.

ABSTRACT DEPARTMENT

SHEPARD, C. F. SUBJECTIVE SYMPTOMS. The Official Bulletin of the Illinois State Society of Optometrists and The Chicago Optometric Society., Vol. 2, No. 4, pp. 198-200. 1924.

Shepard in a paper on ocular and other symptoms, strongly advises optometrists to put more time and effort on the important portion of the ocular refraction, that dealing with the taking and recording of symptoms, and in closing gives the following outline of symptoms and their general causes:

Frontal headaches indicate eyestrain, bad teeth, or sinus infection. Temporal headaches indicate eyestrain, constipation, or neuralgia. Tophead headaches indicate sectual disorders. A swelling sensation just above the ears and pain through the head in that region indicate worry, anxiety, mental effort. Occipital headaches indicate almost anything including common colds, spinal lesion, exhaustion and eyestrain. Throbbing headaches, usually temporal or occipital, indicate lack of oxygen, over-exertion, poisoning of some kind. Pain back of eyes indicates eyestrain, high temperature, and disorders peculiar to women. Morning headaches indicate lack of sleep, toxic poisoning, local infection (pus) from decaying tissue somewhere in the body. Mid-afternoon headaches indicate eyestrain. Headaches after dark, when experienced, usually indicate some special activity or dissipation. Sight-seeing headaches, when surrounded by moving objects, etc., indicate eyestrain.

Nightmares are frequently caused from eyestrain.

Pain when the eyes are moved to the extreme right or left, etc., often indicates temperature above normal. Sun pains may indicate eyestrain, or any one of the numerous diseases of the eye. Sharp pains within the eye ball (except when following patent abuse of the eye) indicate glaucoma, but are hard to distinguish from excessive strain, or excessive light pains. Nausea upon arising indicates pregnancy; at other times (not associated with improper eating) it may indicate eyestrain, and is associated with glaucoma.

High temperature is not caused from eyestrain. Black spots floating before the eyes indicate biliousness; if stationary they denote opacities near the retina. Flashes of light indicate the presence or nearness of blindness or blind spots; "flashes" accompany glaucoma. Floating white specks mean nothing. Blind spells indicate hysteria, anemia, heart trouble, biliousness, eyestrain, or occasionally precede more serious disorders of the eye itself. Haloes of colored light around objects, in ordinary illumination, indicate glaucoma, or disease within the eye. Burning or itching eyes or lids indicate loss of sleep, foreign particles, infection or an inflammatory disease, or eyestrain.

C. C. K.

BLOOD PRESSURE

Under Pathological Notes. The Refractionist (British), Vol. 13, No. 157, pp. 172-174

For measuring blood pressure an instrument called a sphygmanometer is used and the artery is compressed until its wall collapses, the instrument recording the amount of pressure employed. The compression is usually made by wrapping around the arm a large silk cuff which is an air-tight pneumatic, the air being pumped into the sac until pulsations on the distal side of the cuff completely disappear. A tube from the sac leads to the registering device which records the pressure.

Blood pressure, by which is meant arterial pressure, is most conveniently measured in the brachial artery of the left arm. With the patient in the recumbent position wrap the cuff evenly around the upper arm; the first lap of silk being placed over the inner surface of the arm whilst the final lap is tucked between the cuff and the arm. Place the fingers of one hand on the radial artery at the wrist and with the other hand inflate the cuff until pulsation at the wrist disappears when all movement of the index pointer on the dial will have ceased. Either palpation or auscultation can be employed for determining cessation of the blood flow. To employ the former method place the fingers on the radial artery and gradually allow the air to escape out of the

cuff by means of the valve, watching meanwhile the fall of the needle. As it falls it begins to oscillate to and fro, but the first oscillations are due to the shaking of the cuff by the pulsations above it and have no significance. Presently the pulse will be just faintly felt at the wrist and as it first comes through at the point of maximal pressure the reading on the dial will represent systolic pressure.

Continue to let the air slowly out of the cuff, and as the full pulse returns, the needle will make wide abrupt oscillations, the record at this point representing diastolic pressure.

But the palpation method is subject to so many errors that it has almost been abandoned.

Auscultation Method.—For this procedure a stethoscope with a small flat transmitter is required. Neither the pulse nor the character of the oscillations need be regarded except as confirmatory data since the reading of the pressure depends solely upon the sounds heard through the stethoscope.

Place the transmitter of the stethoscope firmly over the artery, just below or just above the inner bend of the elbow with the ear pieces in your ear. Inflate the cuff until no sounds are heard in the stethoscope. Slowly allow the air to escape. The first sounds are dull, indistinct irregular beatings which may be disregarded as they are due to the vibrations of the cuff. On continuing deflation the sounds suddenly change to sharp loud rhythmical clicks. The point where this change takes place denotes the point of systolic pressure and should be read on the dial. Again continue deflating until the sharp clicking sound abruptly changes to soft blowing sounds. Then the reading on the dial will represent the diastolic pressure.

As the normal blood pressure varies within the range of several millimeters only an approximate average can be given.

At the age of twenty the average normal diastolic pressure is, roughly, 70 mm., systolic being about 100 mm. From that time onwards the diastolic pressure rises approximately 0.5 mm. for each year of life, and the systolic about 1 mm. Thus the difference between diastolic and systolic pressure widens each year, the diastolic rising by reason of the increasing resistance due to arterial rigidity, which compels the heart to contract more powerfully in order to overcome the additional obstruction.

Everything else being equal, blood pressure is raised by anything which increases either the force of the heart beat or the resistance in the vessels, and is lowered by that which decreases either or both of these factors. Most physiological elevations of pressure are brought about by an increased action of the heart either through muscular exercise, making an increased demand on the heart, or through mental excitement, producing an increased quantity of pressor internal secretions which stimulate the heart. Sleep and the recumbent posture lower pressure by quieting cardiac action.

Physiological elevations manifest themselves almost wholly in the systolic phase and merely represent an increase in the pulse pressure. A normal person may take the most vigorous exercise or undergo the most marked mental excitement without any perceptible change in his diastolic pressure. Such elevations moreover are transient; they quickly subside when the cause is removed. C. C. K.

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JACK I. KURTZ, Room 209, Yeates Building, Minneapolis, Minnesota.

The Journal has no objection to the reprinting by other magazines of any of its articles, providing such reprints are properly credited to the Northwest Journal of Optometry

SEASON'S GREETINGS

At this time, our first birthday, the staff and publishers of the Northwest Journal of Optometry, wish to extend to the optometric practitioners of the Northwest and the various other states served by this Journal our warmest and most sincere season's greetings.

According to many statisticians the new year promises many good things in the way of prosperity and it is our earnest wish that our optometric readers participate, to the fullest in the splendid times that are to come.

C. C. K.

DR. GORDON H. GLIDDON

The following sketch is written to acquaint the members of the Minnesota State Association of Optometrists, and the optometrists of the northwest, with the principal speaker of the next annual meeting of the Minnesota Association. The writer is intimately acquainted with Dr. Gordon H. Gliddon, both as a student under him and as a co-worker in certain phases of optical study.

Dr. Gliddon received his Bachelor of Science degree from the University of Rochester in 1915, his Master of Science degree from the same institution in 1918. During the years of 1914-1915 he was an assistant in the physics laboratory of the University of Rochester and a physics instructor at the university during the years 1916-1918. Between these periods he was a science instructor at East High School of Rochester, N. Y.

During the time of the American participation in the World War Dr. Gliddon did considerable work in the scientific department of the Hawkeye Works, the lens plant of the Eastman Kodak Company, as a lens designer and formulating a mass of data on optical instruments for the government, in conjunction with the Bureau of Standards. His training in physics and the work on optical instruments naturally led him to the field of optometry, and persuaded by Dr. Harry M. Bestor, in 1920, he became an instructor in psychology, physics and physiologic optics at the Rochester School of Optometry. Dr. Bestor aided and assisted Dr. Gliddon in

grasping a clear understanding of the finer points of optometry, so that having passed the New York Optometric Board he is on the way of being one of the outstanding figures of our profession.

In 1923, Dr. Gliddon was granted a year's leave of absence to do graduate work at Dartmouth College, Hanover, N. H., in preparation for a Doctor of Philosophy degree. This work was taken with Dr. Adelbert Ames, who is research professor of physiologic optics, and one of the leading authorities on this subject in the country. Gliddon's thesis for the degree was the first to be accepted on the subject and he was the first to be granted a degree, using as his subject physiologic optics.

This fall Dr. Gliddon returned to the Rochester School of Optometry as head of the department of Physiologic optics to carry on the work started and developed by Dr. Bestor, who, as before stated, was responsible for his interest in optometry and physiologic optics in particular.

Dr. Gliddon is at heart a student and teacher and is vitally interested in the elevation of the ideals of optometry. His position on the faculty of the Rochester School gives him the opportunity to urge higher educational standards throughout the country. He has chosen optometry as his life's work and is wholeheartedly in favor of, and firmly convinced that, optometry as a field of endeavor warrants a high caliber of students. Some at times criticize the science of optometry as not being wholly correct, but Dr. Gliddon at one time told the writer his investigations make him positive that optometry is on the right track and will make great progress.

Our members will be well repaid by attending the forthcoming annual meeting as Dr. Gliddon is an authority in his chosen field, "the Nervous Mechanism of Vision." Minnesota is honored in having the pleasure of knowing this man, who will, before many years, be a much sought-after figure in optometric education. E. O. F.

SPECIAL REPORT

SELLING OPTOMETRY TO THE PUBLIC

A. S. Anderson, Opt. D.
Fessenden, N. Dak.

There is much truth in the statement that the professional man is a poor business man. No doubt the reason for this state of affairs is that most men entering the field of therapeutics find themselves in a profession that is already "sold" to the public. Medicine and dentistry are good examples. Physicians and dentists must use a certain amount of salesmanship in order to insure their own individual success, but the merits of the sciences which they represent (particularly dentistry) are seldom questioned by the average layman.

Not so with optometry. There are large numbers of people who consult the general practitioner of medicine, who refracts as a side line, or on the other hand the group of folks who wear glazed spectacles. These groups would logically consult an optometrist were they aware of the highly specialized science of optometry.

In late years large sums of money have been spent to make America eye conscious. This money was spent by disinterested organizations, by manufacturers of optical goods, and also by optometrists themselves, both individually and collectively. Most of the disinterested organizations who undertook to help the cause of eyesight conservation have maintained a position of strict neutrality, leaving the public in the dark as much as ever as to where to go for eyesight correction. The purpose back of the advertising of the optical manufacturers is to sell their particular line, so the eyesight conservation value of this publicity must be discounted considerably. The public can readily see the motive back of this form of advertising. The advertising done by the optometrists themselves, especially the collective advertising, has no doubt brought the best results. One trouble is that we have laid too much stress on eyesight conservation and the individual optometrist, instead of putting forth optometry as a superior ocular science. We

know from everyday contact with the work of medical refractionists that we can do better work in refraction and muscular imbalance without the use of drugs than the medical men can do with them. We should capitalize these points in our publicity for optometry and not try to avoid or ignore the issue. The task of placing optometry in its rightful position in the public mind is squarely up to the optometrists themselves. Not as individuals, but collectively through their state societies and the national organization.

Some state and city organizations have promoted optometric publicity campaigns and have been well satisfied with the results. Others have tried and have become discouraged because the results were not immediate or else not proportionate to the cost. It might be well to try and analyze the causes of failure and see if they can be corrected. Usually the publicity matter itself is good and not open to criticism, the chief fault generally lies in the medium of presentation. Optometrists make a big mistake in paying for display advertising space in newspapers when the press syndicates throw open their news columns and feature sections free of charge to propaganda of all sorts. When the layman reads an article in a newspaper on eye care presented in a medical vein as news, he is more apt to believe it than our message surrounded by a huge black border. Perhaps on the same page as our advertisement will be an ad extolling the merits of a new patent medicine or announcing some sensational sales event. Advertising of this nature is not only unethical but ineffective.

Radio lectures and free clinics are no doubt good avenues of publicity, but they do not reach as many people as a direct-by-mail advertising campaign would. There are one hundred and ten million people in the United States and the cost of circularizing all of them would be prohibitive. But why not begin with a small group? We know that to an extent public opinion is shaped by editors, preachers, school teachers, and public officials. The first step, which is also the most economical and most effective one in selling optometry to the public, would be to educate the educators, using well prepared letters or booklets fully explaining the science of optometry.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA PLANS CONVENTION

Dr. Roy S. Dean, chairman of the Department of Education of the Minnesota State Association of Optometrists, is arranging an elaborate program for our coming convention in February. With the aid of Dr. E. O. Fjelstad of Red Wing he has secured Dr. Gordon H. Glidden of Rochester, New York, who will present several papers to the convention. Dr. Gliddon will speak on "The Nervous Mechanism of Vision"—"Color and Color Theories," and also on "The Future of Physiologic Optics." A full review of his talks will appear in the February number of this Journal. Dr. Dean has also been in correspondence with Dr. J. A. Heidbrink, a well known dentist of Minneapolis. Dr. Heidbrink has consented to speak to our group on "Focal Infection and its Relation to Eyestrain." This paper will be given with the aid of slides to illustrate just what is seen in radiograms and to enable the optometrist to more fully cooperate with the dentist. It is further reported that Dr. Dean has made arrangements to bring the toastmaster, for our banquet, with him from Duluth.

Dr. J. A. Kubicek, president of our society, has written in and is very desirous to add to this program, a refractive clinic, and is making plans to hold one in conjunction with the convention.

Dr. Kubicek has also set the dates for the convention, these being as follows: Monday and Tuesday, February the 16th and 17th, 1925.

In conjunction with Dr. J. I. Kurtz he has also appointed the convention committees, with Dr. L. L. De Mars general chairman. The committees follow:

Arrangements Committee

Drs. A. H. Nordland, Minneapolis, chairman; A. Norstrom, Minneapolis; Gertrude Stanton, Minneapolis.

Nominating Committee

Drs. A. C. Hoffman, Minneapolis, chairman; Ed. Prochaska, Pine City; V. P. O'Brien, Duluth.

Auditing Committee

Drs. K. J. Knapp, Minneapolis, chairman; H. B. Kollofski, St. Paul.

Resolutions Committee

Drs. A. Norstrom, Minneapolis, chairman; H. O. Watzke, Morris; J. A. Fandel, St. Paul.

Publicity Committee

Drs. F. A. Zimmerman, Minneapolis, chairman; J. I. Kurtz, Minneapolis; Geo. C. Jensen, St. Paul; E. H. Kiekenapp, Faribault.

Educational Committee

Drs. Roy S. Dean, Duluth, chairman; E. O. Fjelstad, Red Wing; Alfred J. Large, Winona; W. H. Nordin, Faribault; Hugo O. Schleuder, New Ulm; C. G. Mack, Minneapolis.

Clinics Committee

Drs. E. H. Kiekenapp, Faribault, chairman; J. L. Kubicek, Waseca; J. I. Kurtz, Minneapolis; R. S. Burquist, Duluth; Jos. Haustein, Red Wing; C. C. Koch, Minneapolis.

Dr. A. H. Nordland, chairman of the Department of Legislation, reports that the money being raised to further our work along this line is coming in, in a very satisfactory manner. Of course there are those who have as yet made no returns, and he at this time, urges those men to do so at once.

Dr. Ernest Kiekenapp, secretary of the Minnesota State Board of Optometry and co-worker with Dr. Nordland, reports that the proposed amendments to our law consists chiefly of those made to strengthen the law thus enabling the board to secure convictions for its violations in a somewhat easier manner and also to, in a measure, raise the present educational standards to equal those of other states of the union.

Dr. J. I. Kurtz, secretary of the Minnesota society, urges members to pay their 1925 dues at once. Our program for the new year is a large one and in many ways an expensive one, and the association bills should be met promptly. This can only be done by the whole-hearted co-operation of every member. The 1925 statements are now in the members' hands and all men who have not done so already, are urged to send in their checks for dues at this time.

MINNEAPOLIS SOCIETY REPORT

The Minneapolis Association of Optometrists met at the Odin Club, December 10th, the last scheduled meeting for 1924.

This meeting was one of the most important during the year, the chief issue being the consideration of the advertising campaign. It was decided to discontinue the collective display advertising for the year of 1925.

No definite program for publicity was decided upon. Clinic talks over the radio and at public meetings were suggested. A plan under foot will be announced later, which, if placed in operation, will be a great boon to optometry throughout the nation.

The next scheduled meeting is set for January 21st.

President De Mars appointed the following committees:

Program and entertainment committee: Drs. L. L. De Mars, chairman; C. M. Ericson, G. Stanton, G. A. Blohm, L. F. Arduser.

Membership committee: Drs. F. W. Van Drasek, chairman; A. O. Norstrom, Einar Markhus, A. Strand, John Linner.

Finance committee: Drs. C. P. Nelson, chairman; J. E. Peterson, John Linner, J. P. Iverson.

Publicity committee: Drs. A. H. Nordland, chairman; F. A. Zimmerman, K. J. Knapp, M. S. Lockwood.

Three special committees were appointed to investigate and report on the possibilities of publicity through radio, clinics, etc.

A. O. Norstrom, Opt.D.,
Secretary.

SUCCESSFUL CANDIDATES OF NEBRASKA BOARD

At the recent state examination in optometry held at the State House at Lincoln, Nebr., the following were successful: Richard Britton, 818 S. 21st St., Omaha; Albert J. Cain, McCook; Joy P. Miller, Auburn; Clarence Kleeberger, Omaha; Watts M. Foley, Nebraska City; Ralph J. Hays, 1124 42nd St., Des Moines, Iowa.

In Memorium

HARRY M. BESTOR, Opt. D., F.A.A.O.

The death of Dr. Harry M. Bestor, optometrist of Rochester, New York, comes as a severe shock to all who knew him.

It was the pleasure of the writer to have known Dr. Bestor and also to have attended his lectures on Physiological Optics at the Rochester School of Optometry. In this splendid work, as in other optometric matters, Dr. Bestor took great pride, and he was constantly striving to foster higher and nobler professional ideals upon his students. His lectures on practical optometry were of the highest order, they being most instructive, and in the same measure did he carry on his society work with his colleagues.

Those who knew Dr. Harry Bestor personally will miss him greatly and all men who know him only by his great work for optometry will honor his memory.

E. O. F.

MESSAGES OF CONDOLENCE TO THE BESTORS

As soon as Dr. J. I. Kurtz, secretary of the Minnesota State Association learned of the death of Dr. Harry Bestor, he ordered a suitable floral emblem sent to Mrs. Bestor, Rochester, N. Y., together with the following telegram:

"Mrs. Harry Bestor, Rochester, N. Y.:

"The Minnesota State Association of Optometrists wishes to express its sincere regret and greatly mourns the loss of Dr. Bestor. His death is great loss to Humanity, Science and Optometry. Kindly accept our message of condolence.

Dr. J. I. Kurtz, Secretary."

Dr. L. De Mars, President of the Minneapolis Optometric Association, and Dr. George C. Jensen, secretary of the St. Paul Optometric Association, have taken similar action.

NORTH DAKOTA SOCIETY REPORT

The direct-by-mail Schools Publicity Campaign, undertaken by the association for the purpose of educating the school teachers of the state as regards the relationship of the optometrist to eye care, has met with the enthusiastic approval of the membership. To date about one-third of the school teachers in the state have received the literature sent out from the secretary's office.. It is not the plan of the association to send their publicity matter to all the teachers, but only to those in counties where the association is represented with a paid-up membership.

About one-third more of the school teachers who have not received our literature, live in counties where there are association members. The reason they have not been included is due to the fact that local optometrists in those counties have not co-operated with the secretary in sending in mailing lists. All optometrists who are not taking advantage of this publicity are urged to send in mailing lists of the school teachers in their respective counties. Such mailing lists can be obtained from your county superintendent of schools.

To date, December 19th, the following optometrists have paid their 1925 dues and are entitled to this association service: Drs. C. E. Hale, Rugby; H. Kornmesser, Jamestown; R. McLaughlin, Hope; C. G. Coyne, Mandan; L. J. Anderson, Grand Forks; C. G. Hendrickson, Grand Forks; R. P. Merritt, Kenmare; G. R. Peterson, Fargo; R. E. Bonham, Bismarck; and N. J. Zeller, Lisbon.

Start the New Year right and get your name on the honor roll and receive this service. Send your check for $12.00 to the secretary now.

CURRENT LITERATURE

These are the titles of papers bearing on optometry, or papers written in such a manner as to be of interest to optometrists. These papers appear in various optometric and ophthalmic publications, as indicated. The papers have been grouped under appropriate heads, and in each group arranged alphabetically, usually by the Author's name in **heavy face type.** The abbreviations mean: (Ill.), illustrated; (Pl.), plates; (Abst.), indicates that it is an abstract of the original article; and (Dis.), that discussion is published with paper.

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Contino. Method for the Determination of Visual Acuity. (Abst.) Amer. Jour. of Oph. Series 3, Vol. 7, No. 11, p. 888.

Evans, J. N. Standardized Test Objects for Visual Field Studies. (Ill.) Amer. Jour. of Oph., Series 3, Vol. 7, No. 11, pp. 854-855.

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Friedenwald, J. S. Freely Movable Instrument for Ophthalmoscopy with Yellow Green Light. (Ill.) Amer. Jour. of Oph., Series 3, Vol. 7, No. 12, pp. 940-943.

Hoffman, A. C. A New Record Card, Near Point Reading Card and Muscle Test. (Ill.) N. W. Jour. of Optom., Vol. 1, No. 12, pp. 262-265.

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Lawson, A. Tinted Lenses and Their Uses. The Opt. (Brit.), Vol. LXVIII, No. 1753, pp. 202-203.

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Walters, C. H. Circumlental Space in Its Relation to Accommodation. (Ill.) The Opt. (Brit.), Vol. LXVIII, No. 1756, pp. 247-248.

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Bruner, W. E. Cataract Following Electric Shock. Amer. Jour. of Oph., Series 3, Vol. 7, No. 12, p. 950.

Greenwood, A. The Non-operative Treatment of Cataract. E. E. N. & T. Mo., Vol. 3, No. 10, pp. 555-557.

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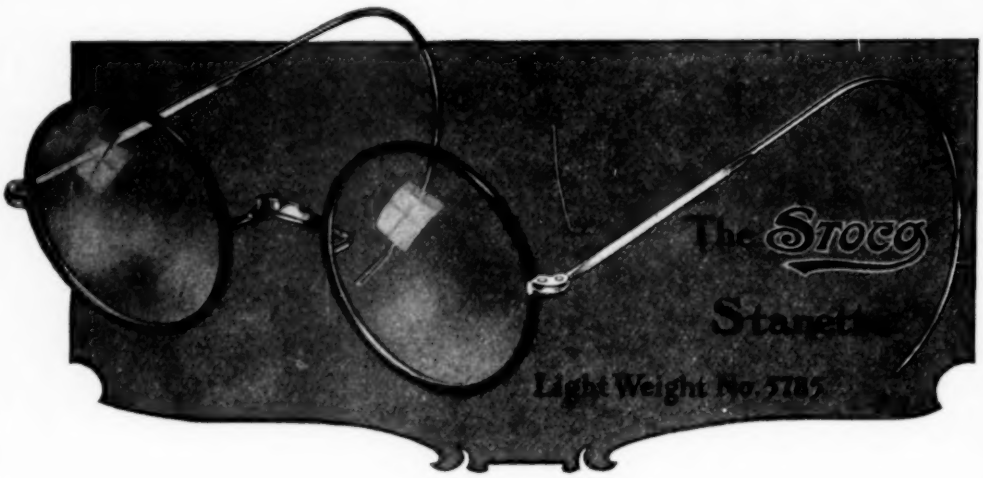

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